

Claim 8. (Twice Amended) A method of manufacturing a multi-layered barrier metal thin film by atomic layer chemical vapor deposition, comprising the steps of:

providing a substrate in a reactant chamber;

providing a first chemical species in said reactant chamber;

providing a second chemical species in said reactant chamber,

wherein said first and second chemical species react to deposit a first layer of a barrier metal thin film of a first metal nitride on said substrate by atomic layer chemical vapor deposition;

providing a third chemical species in said reactant chamber; and

providing a fourth chemical species in said reactant chamber,

wherein said third and fourth chemical species react to deposit a second layer of said barrier metal thin film of a second metal nitride directly on said first layer by atomic layer chemical vapor deposition, wherein said second metal nitride is different from said first metal nitride,

wherein said barrier metal thin film deposited on said substrate defines a thickness of less than 100 Angstroms.

Claim 14. (Twice Amended) A method of manufacturing a multi-layered barrier metal thin film by atomic layer chemical vapor deposition, comprising the steps of:

providing a substrate in a reactant chamber;

providing a first chemical species in said reactant chamber;

providing a second chemical species in said reactant chamber,

wherein said first and second chemical species react to deposit a first barrier metal thin film of a first metal nitride on said substrate by atomic layer chemical vapor deposition;

providing a third chemical species in said reactant chamber;
providing a fourth chemical species in said reactant chamber,
wherein said third and fourth chemical species react to deposit a second
barrier metal thin film of a second metal nitride directly on said first barrier
metal thin film by atomic layer chemical vapor deposition, wherein said first
metal nitride is different from said second metal nitride.

Claim 21. (First Amended) A method of manufacturing a
multi-layered barrier metal thin film by atomic layer chemical vapor
deposition, comprising the steps of:

providing a substrate in a reactant chamber;
depositing a first layer of a first metal nitride on said substrate
by atomic layer chemical vapor deposition; and
depositing a second layer of a second metal nitride directly on
said first layer by atomic layer chemical vapor deposition;
wherein said first metal nitride is different from said second
metal nitride.

REMARKS

This Request for Continued Examination and Response Under
37 C.F.R. § 1.114 responds to the Final Office Action dated December 31,
2002, in the above-identified patent application.

By this response, Applicants have amended claims 8, 14 and 21.
Claims 8-10 and 12-25 are under consideration in the application, of which
claims 8, 14 and 21 are in independent form. No claims are currently
allowed.